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X LINGUISTIC MARATHON

TASK 5: Phrase Structure Grammar (Task I 7pts, Task II 3pts)

INTRODUCTION

Formal linguistics is interested in representing the language competence (mental grammar) of people speaking a particular language in the form of a set of explicit rules – a ***formal (or generative) grammar****. A formal grammar of a language is considered* ***adequate*** *if it is capable of generating all and only the constructions that native speakers of this language would accept as correct. One kind of formal grammar is known as* ***phrase structure grammar****. It makes use of* ***phrase structure rules****, like the one in the example below:*

(1) VP => V NP

The rule in (1) says that the symbol VP can be rewritten as (replaced by) a string of two symbols: V and NP. Linguistic structures are generated by a ***sequence of rule applications****, starting with some* ***initial symbol*** *(typically S standing for Sentence).Each rule (except for the first one) applies to the product of the previous rule application.*

Below, you will find a simple phrase structure grammar (SPSG) in the form of a set of rules.

SIMPLE PHRASE STRUCTURE GRAMMAR (SPSG)

(**R1**) S => NP VP (**R2**) VP => V NP (**R3**) VP => V C S (**R4**) VP => V (**R5**) NP => Art AdjP N (**R6**) NP => Art N (**R7**) NP => N	(**R8**) AdjP =>Adj (**R9**) V => any English verb (e.g. *be, find, arrive, meet*) (**R10**) N => any English noun (e.g. *dog, tree, John*) or pronoun (e.g. *I, you, we*) (**R11**) C => any English complementizer (e.g. *that, whether*) (**R12**) Adj => any English adjective (e.g. *red, big, blue*) (**R13**) Art => any English article (*a/an, the*)

Take a look at the sentence below:

(2) A lumberjack sings.

A procedure for generating sentence (2) using the rules of the SPSG is given in the table below, proving that the SPSG is capable of producing it. For each step, in the STRING column there is a string of symbols and in the RULE APPLICATION column there is a rule applying to one of the symbols in the string (the symbol is highlighted). Each string is a product of the preceding step, except for the first one which consists of the initial symbol S.

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STEP	STRING	RULE APPLICATION
1	**S**	(**R1**) S => NP VP
2	**NP** VP	(**R6**) NP => Art N
3	Art N **VP**	(**R4**) VP => V
4	**Art** N V	(**R13**) Art => any English article (a)
5	a **N** V	(**R10**) N => any English noun (lumberjack)
6	a lumberjack **V**	(**R9**) V => any English verb (sing)
#	a lumberjack sing	no rule can apply to any of the symbols

TASK 1

*Below you can find 14 sentences. Some are correct English sentences and others (marked with *) are ungrammatical in English. For each sentence decide whether it could be generated by the SPSG (by underlining YES) or not (by underlining NO). Ignore the problems with tense and subject-verb agreement.*

1. John and Mary walk.
Can the sentence be generated by the SPSG? YES / NO

2. A boy walks.
Can the sentence be generated by the SPSG? YES / NO

3. A smart boy walks.
Can the sentence be generated by the SPSG? YES / NO

4. John visited Mary.
Can the sentence be generated by the SPSG? YES / NO

5. A girl walks slowly.
Can the sentence be generated by the SPSG? YES / NO

6. Mary gave me a book.
Can the sentence be generated by the SPSG? YES / NO

7. He is a genius.
Can the sentence be generated by the SPSG? YES / NO

8. A dog will bark.
Can the sentence be generated by the SPSG? YES / NO

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9. *The John sings.
Can the sentence be generated by the SPSG? YES / NO

10. The girl with a tablet is a student.
Can the sentence be generated by the SPSG? YES / NO

11. *Mary visited.
Can the sentence be generated by the SPSG? YES / NO

12. *The careless driver arrived the train.
Can the sentence be generated by the SPSG? YES / NO

13. John walks in the park.
Can the sentence be generated by the SPSG? YES / NO

14. John thinks that he is a genius.
Can the sentence be generated by the SPSG? YES / NO

TASK 2

Given your answers in Task 1 and the concepts presented in Introduction, is the SPSG an adequate grammar of English? Explain your answer in (UP TO FOUR SENTENCES)*:*

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KEY:

RELEVANT INFORMATION ON THE SPSG

The system can generate simple transitive, intransitive and copular English sentences with a standard order of constituents containing no adverbs, prepositions, conjunctions, auxiliary or modal verbs. It supports the embedding of clauses within other clauses as verb complements.

SOLUTION FOR TASK 1

1. NO
2. YES
3. YES
4. YES
5. NO
6. NO
7. YES
8. NO
9. YES
10. NO
11. YES
12. YES
13. NO
14. YES

SOLUTION FOR TASK 2

No. The SPSG is not an adequate formal grammar of English because it can generate ungrammatical combinations of English words and cannot generate some grammatical English sentences.

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